OPERATORS MANUAL &
FITTING INSTRUCTIONS
FOR THE
LH 1000 MONITOR

LH No. 020-012-UK Version 2.00

Contents

INTRODUCTION

Congratulations with your new LH 1000 tractor monitor.

During development of this monitor we have made a point of producing a durable product that is simple to operate.

We have endeavoured to deliver a fault free product. To ensure optimal use of the equipment we ask that great attention be paid when reading the manual. We are more than happy to help should any queries arise, both when the product is used for the first time and at any later date. Regarding responsibility for use of the product we refer to our sales and delivery terms especially paragraph 7, which follows:

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7.      Product usage.

7.1     Any use of the product is at the sole risk of the buyer. The
        buyer is therefore not entitled to any form for compensation
        caused by, for example, any of the following:

        ▪ Disturbance to/from any electronic services or products that
          do not confirm to the standards for CE marking,

        ▪ Missing or poor signal coverage or a succession hereof from
          external transmitters/receivers, used by the buyer,

        ▪ Functional faults, which apply to or from a PC-program or PC-
          equipment, not delivered by the seller,

        ▪ Faults that may arise from the buyers negligence to react to
          warnings and fault messages from the product, or which can be
          traced to negligence and/or absent constant control of the
          work carried out in comparison to the planned job.

7.2     When implementing any new equipment the buyer must take great
        care and pay attention. Any doubts as to correct operation/use
        should result in contacting the sellers service department.
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This manual may not be altered, copied or manipulated in any way. Unoriginal manuals can lead to operational faults damaging machines or crops as a consequence thereof. LH Agro can therefore not be held responsible for damages incurred, which can be traced to the use of unoriginal or manipulated manuals. Original manuals can be requisitioned at any time from LH Agro.

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GENERAL OVERVIEW

1703-0004
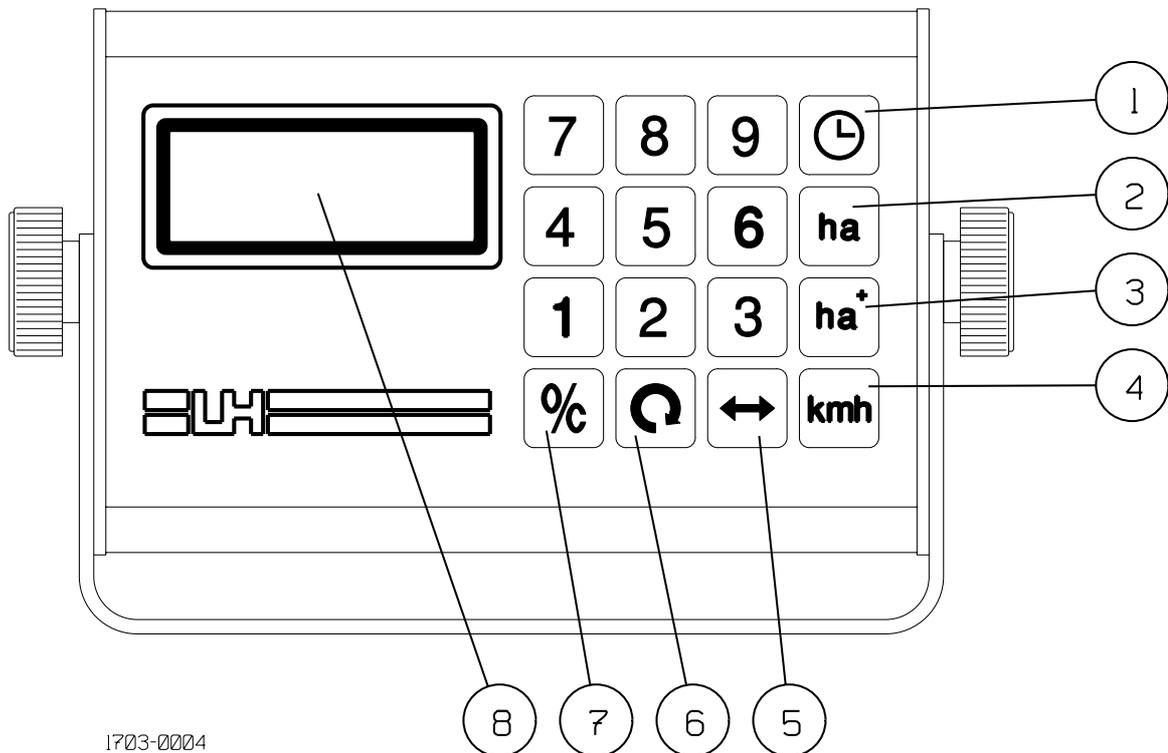
Pos.	Description	Pos.	Description
1	Time functions key	5	Working width encodement
2	Area (trip)	6	Wheel circumference encodement
3	Area (total)	7	Reset key
4	Forward speed	8	Display

THE LH 1000

The LH 1000 is a very simple monitor to operate, which is able to monitor the following:

NB! The six functions contained in LH 1000, are arranged in two sets and cannot be used simultaneously.

Function set 1	Function set 2
▪ TIME	▪ TIME
▪ AREA	▪ RPM
▪ FORWARD SPEED	▪ DISTANCE
	▪ UNITS

All the functions within the selected set of functions are calculated simultaneously. This means, that you can monitor, e.g. your speed, and at the same time the monitor counts area and time.

All entered values and gathered data are stored in a memory, if power, deliberately or not, is cut off.

LH 1000 can be used on the following:

- ▪ TRACTORS
- ▪ COMBINE HARVESTERS
- ▪ MOBILE SPRAYERS
- ▪ IN FACT ANY AGRICULTURAL MACHINE

On the following pages you will find a description of how to encode, use, test and fit your LH 1000.

SECTION FUNCTION

With this function the working width is divided into four equal sections. This section function reduces the area measured by the number of sections that have been switched off. This function works as follows:

- ▪ Pressing the numerical key "1" will reduce the working width to 1/4 of the encoded working width.

- ▪ Pressing the numerical key "2" will reduce the working width to 2/4 of the encoded working width.

- ▪ Pressing the numerical key "3" will reduce the working width to 3/4 of the encoded working width.

Full working width can be achieved manually by pressing the numerical key "4" or automatically when the implement sensor is activated.

ENCODING THE LH 1000 (FUNCTION SET 1)

There are two figures that need to be encoded before the LH 1000 can be used. It is important that the following are accurate as these are fundamental for correct operation of the monitor.

WORKING WIDTH

The working width of the implement being used is encoded here:

Step	Key	Procedure
1	↔	Press the working width key.
2		Encode the working width in **centimetres** using the numerical keys. Ensure that overlaps are accounted for. If the working width is unknown, then drive 5 bouts and measure the distance between the first and the last, then divide the distance by 5.
3		The encoded value is stored automatically until another working width is encoded; press any other key to leave this encodement.

FORWARD SPEED CALIBRATION (WHEEL CIRCUMFERENCE)

To ensure that the LH 1000 can accurately measure forward speed, which is also used for area calculation, the wheel circumference must be measured and encoded. The procedure for this is as follows:

WHEEL CIRCUMFERENCE WITH MAGNETS FITTED TO THE WHEEL

Step	Key	Procedure
1		Make a mark on the field and on the tire on the wheel with magnets fitted.
2		Drive slowly forward until the wheel has turned 10 times.
3		Make a mark on the field again.
4		Measure the distance between the 2 marks on the field and divide this distance with 10 the result being the effective wheel circumference.
5		Divide the effective wheel circumference with the number of magnets fitted to the wheel.
6	↻	Press the wheel circumference key and an >0< appears on the left of the display indicating that "wheel circumference" has been selected.
7		Encode the result (from steps 1 to 5) in centimetres using the numerical keys.
8		The encoded value is stored automatically until another wheel circumference is encoded; press any other key to leave this encodement.

Example:

In the following example we assume that we use a tractor with a wheel circumference of 500 cm and 2 magnets fitted to the wheel:

Measurement shows that the effective wheel circumference = 500.6 cm.

There are 2 magnets fitted so the effective wheel circumference needs to be divided with 2.

500.6 : 2 = 250.3 cm

*Encode this as **250***

WHEEL CIRCUMFERENCE WITH A MAGNET FITTED TO CARDAN SHAFT

A magnet can be fitted to the cardinal shaft if, for some reason, it is not possible to fit any magnets onto a wheel. To determine the value to be entered as the "wheel circumference" use the following procedure:

Step	Key	Procedure
1	↔	Enter a working width of 9999 as described on page 7.
2	ha⁺	Press the area total key.
3		Drive slowly forward until 1 appears on the display STOP IMMEDIATELY.
4		Make a mark on the field and on the tire.
5		Drive until the display changes from 10 to 11 STOP IMMEDIATELY.
6		Make a mark on the field again.
7		Measure the distance between the 2 marks on the field. Divide this distance with 10.
8	↻	Press the wheel circumference key and an >0< appears on the left of the display indicating that "wheel circumference" has been selected.
9		Encode the value determined in steps 1 to 7 using the numerical keys.
10		The encoded value is stored automatically until another wheel circumference is encoded; press any other key to leave this encodement.

Remember to encode the correct working width for the implement again!

OPERATING THE LH 1000

FUNCTION SET 1

WORK TIME IN HOURS AND MINUTES

Key	Function
🕐	Pressing this key displays the effective work time (max. 99 hours 59 minutes)
	The time counter is started and stopped by pressing the key.
	Flashing colon >:< means that the time counter is running.
	Constant colon >:< means that the time counter is stopped.
%C	Pressing this key for min. 3 seconds resets the counter.

AREA TRIP & TOTAL COUNTERS

The area counters start and stop automatically when the implement is in work/not in work (implement sensor) and continue to count regardless of what other function in function set 1 has been selected. Area is not being measured if an >r< is displayed on the screen.

Key	Function
ha	**Trip counter:** Pressing this key displays the area covered in ha with 2 decimals from 0 to 99.99 ha and with 1 decimal from 100 to 999.9 ha.
%C	Pressing this key for min. 3 seconds resets the counter.
ha⁺	**Total counter:** Pressing this key displays the total area covered in ha with 2 decimals from 0 to 99.99 ha and with 1 decimal from 100 to 999.9 ha. This function can be used to sum area covered for, i.e. a month.
%C	Pressing this key for min. 3 seconds resets the counter.

FORWARD SPEED

Key	Function
kmh	Pressing this key displays the present forward speed in kilometres per hour with 1 decimal.
	Forward speed is <u>always</u> displayed when the monitor is switched on.
	An "r" on the left-hand side of the display under this function, indicates that the area override sensor has been activated.
	Forward speed is zeroed after approx. 8 second after stopping.

FUNCTION SET 2

As mentioned in the introduction, the LH 1000 has 2 function sets. To select function set 2 a working width of 9999 must be encoded, do as follows:

| ↔ | 9 | 9 | 9 | 9 | Press the shown keys in this order.

The following functions are now available:

RPM

Key	Function
kmh	Pressing this key displays RPM if the following conditions are met: ▪ Function set 2 has been selected. ▪ An RPM sensor is connected to the wheel sensor input. ▪ There is only 1 magnet fitted per revolution.

UNIT COUNTER

Key	Function
ha⁺	Pressing this key displays units counted if the following conditions are met (one unit is counted each time a magnet passes the sensor): ▪ Function set 2 has been selected. ▪ A wheel sensor where units are to be counted has been fitted. The unit counter can be reset in the same manner as the area total counter.

DISTANCE COUNTER

Key	Function
ha	Pressing this key displays the distance measured in metres if the following conditions are met: ▪ Function set 2 has been selected. ▪ The wheel circumference is encoded in centimetres. The distance counter can be reset in the same manner as the area trip counter.

FITTING THE LH 1000

FITTING THE MONITOR

Fit the monitor where it can be easily seen by the operator whilst driving. We recommend on top of the instrument panel or to the right-hand side of the cabin above the lift operating handles.

The form supplied with the LH 1000 can be stuck in the cabin so that the noted values can easily be found and re-entered if necessary.

POWER SUPPLY

The supplied power cable should be connected to 12V so that the monitor is switched on and off with the ignition (ignition live).

The power cable wires should be connected thus:

Blue = +12V (power)

Brown = 0V (ground)

IMPORTANT! Never incorrectly connect these wires, as the monitor will be damaged instantly.

GENERAL WIRING

Lead all cables so that they are as protected as possible. Wherever possible lead the cables alongside existing cables, hydraulic pipes or similar, and fasten with the supplied cable ties.

Beware of moving parts and heat sources, e.g. exhaust pipes.

Cables in the cab that cannot be hidden should be fastened with adhesive cable fasteners, clean the surface thoroughly with, i.e. alcohol before sticking the cable fasteners to the surface.
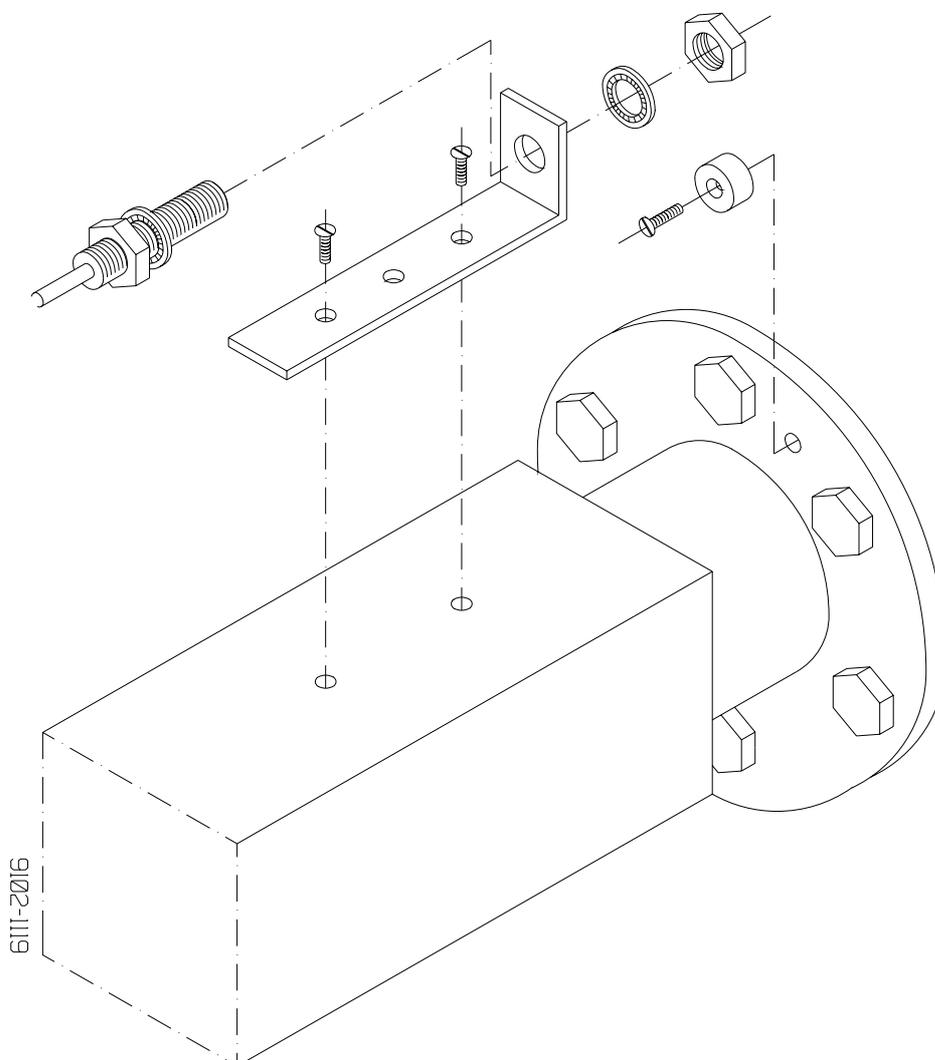
FITTING THE WHEEL SENSOR

We recommend fitting the wheel sensor to the tractors right back wheel. See the following diagram.

The distance between the magnets and the wheel sensor must not be greater than 5 mm. Fit 2 magnets if the effective wheel circumference is larger than 250 cm.

NOTE!   The magnets **must** be fitted with equal distance otherwise the displayed forward speed will be erratic.

The magnets can, i.e. be fitted next to the wheel bolts.

Always fit the magnets with the yellow dot facing the sensor.

The wheel sensor can be fitted to the cardinal shaft on 4-wheel drive machines.

A "**bipolar**" sensor must be used when fitting to the cardinal shaft. This sensor must be ordered separately as it is different than the supplied sensor (see the following diagram for a typical fitting of a sensor to the cardinal shaft):
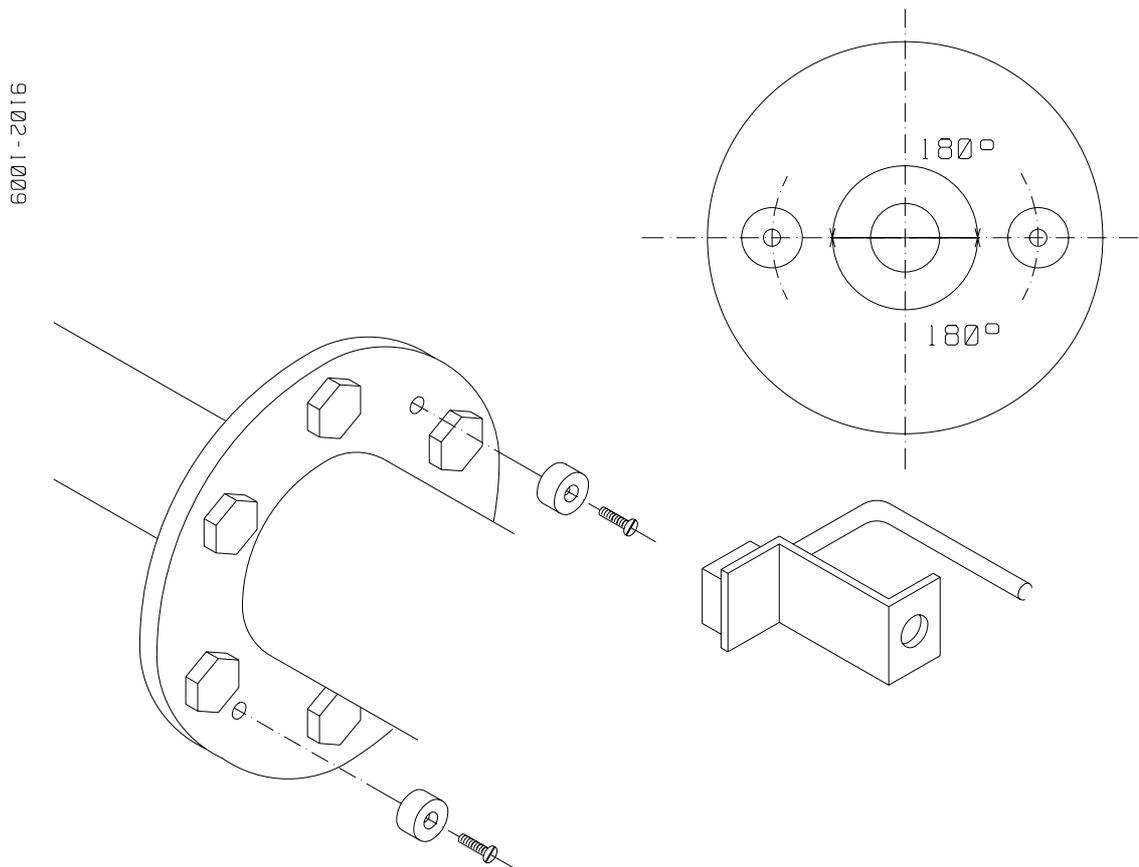
FITTING THE AREA ON/OFF (IMPLEMENT) SENSOR

Typical fitting of the implement sensor on the tractor's lift arms:
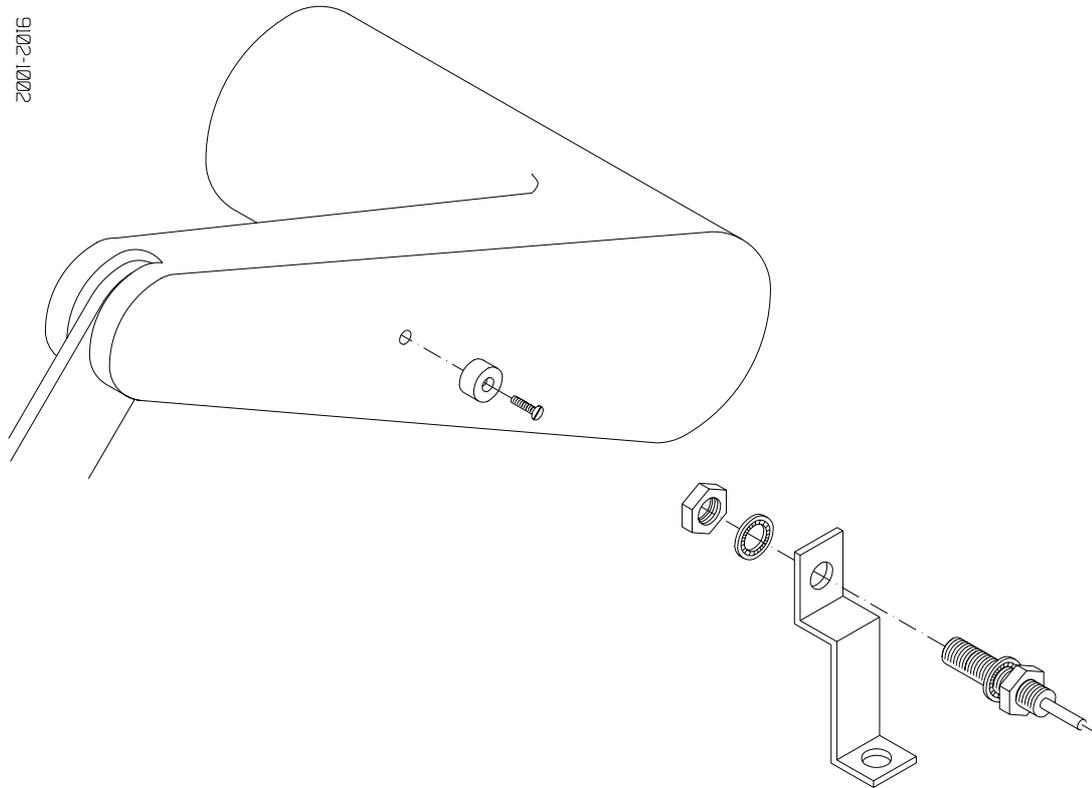
The implement sensor can be fitted in other positions (PTO handle, hydraulic cylinders, other handles, etc.). There must be movement of minimum 50 mm. The distance between the sensor and the magnet must not exceed 5 mm.

An electrical signal from, i.e. a sprayer switch box, etc. can be used as the implement signal. The signal **must** change to **0V** (**ground**), when the implement is **not** working.
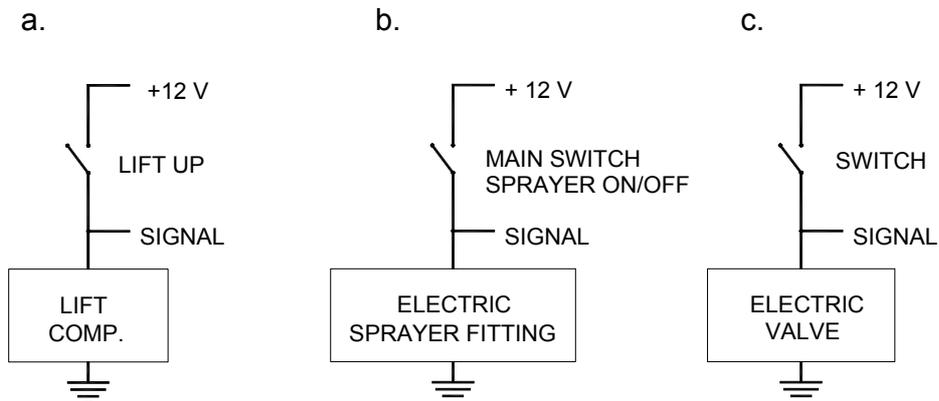
IMPORTANT!   Never connect power (+12V) to the brown output on the LH 1000, as this will damage the LH 1000.

TESTING THE SYSTEM

The sensors & monitor can be tested for correct operation as follows:

Enter a working width of 8888 thus:

| ↔ | 8 | 8 | 8 | 🕐 | Press the shown keys in this order.

The LH 1000 will now display:

"**h**" each time the wheel sensor is activated.

"**r**" each time the implement sensor is activated.

Note! "**r**" will appear when displaying forward speed when the implement sensor is activated.

ERROR WARNING

To ensure that data will not be lost, the LH 1000 has a built in error indication:

If your LH 1000 displays this error warning, the supply voltage to the monitor is too low. Check therefore the power supply to the monitor (both + and -).

NOTES